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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/911,902	07/23/2001	Omar M.A. Gadir	07575-053001	4192

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EXAMINER

DAMIANO, ANNE L

ART UNIT	PAPER NUMBER
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2114

DATE MAILED: 06/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/911,902

Applicant(s)

GADIR ET AL.

Examiner

Anne L Damiano

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 7/23/01.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 10, 12, 14-20, 22-27, 29, 31-35 and 38 is/are rejected.
- 7) ☒ Claim(s) 8,9,11,13,21,28,30,36,37,39 and 40 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>6</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Allowable Subject Matter

1. Claims 8, 9, 11, 13, 21, 28, 30, 36, 37, 39 and 40 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 2, 5-7, 12, 14-20, 25-27 and 31-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Gamache et al. (6,453,426).

As in claim 1 Gamache discloses a file server system, comprising:

Two or more nodes, each node configured to run two or more virtual servers (group), each virtual server having as exclusive resources a virtual interface to clients and one or more file systems (column 4: lines 45-48, column 5: line 62- column 6: line 5 and figure 4). (The nodes that make up the cluster are comprised of groups. Each group includes all of the elements

needed to run a specific application including an IP address. The IP address is the virtual interface to clients (column 6: line 2-5). The computing environment for which this system is intended includes an interface to file system (column 4: lines 45-48).)

As in claim 2, Gamache discloses the system of claim 1, wherein the virtual interface comprises a virtual IP address (column 6: line 2-5 and lines 39-50). (Each group contains an application that depends in an IP address. When a node fails, its active groups are pulled to a different node. The group is including its IP address, meaning that it is a virtual IP address.)

As in claim 5, Gamache discloses the system of claim 1, further comprising failover computer program instructions operable to be executed to cause the system to:

Detect a failure of a first node; and

Migrate (failed over) each virtual server (group) on the first node to a different node in the system (column 6: lines 39-48).

As in claim 6, Gamache discloses the system of claim 5, wherein each virtual server has an associated failover priority, and the failover instructions further comprise instructions to:

Migrate virtual servers in order of their respective priorities (column 9: lines 24-27).
(Failing over according to an ordered list of owners is migrating in order of each group's respective priorities.)

As in claim 7, Gamache discloses the system of claim 5, wherein the failover instructions further comprise instructions to:

Recognize a virtual server that is identified as not to be migrated in the event of node failure and prevent migration of a so-identified virtual server when it is on a node that fails (column 6: lines 46-50 and column 7: lines 25-37). (The manager initiates the migration. Only the active groups are migrated. This means that the manager recognized the inactive groups and prevents these inactive groups from being migrated.)

As in claim 12, Gamache discloses the system of claim 1, wherein the system comprises load-balancing computer program instructions operable to be executed to cause the system to:

Calculate a balanced distribution of the virtual server loads across the nodes of the system, excluding any failed nodes; and

Perform load balancing by migrating one or more virtual servers from heavily loaded nodes to less heavily loaded nodes (column 9: lines 44-52).

As in claim 14, Gamache discloses the system of claim 1, further comprising computer program instructions operable to be executed to cause the system to:

Detect an inability on a first node to access of shared storage unit; and

In response to detection of the inability to access the shared storage unit, migrate all virtual servers containing file systems on the shared storage unit to an alternative node that can access the storage unit if such an alternative node exists in the system (column 6: lines 27-50). (The communication path the a failing node does not have access to is interpreted as a shared

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storage unit. When a node does not respond with a heartbeat, the node must not have access to the shared storage unit. When no response is received, that inability to access the shared storage unit is detected and the virtual servers are migrated to an active node.)

As in claim 15, Gamache discloses the system of claim 12, wherein the load-balancing instructions are further operable to determine a load on each virtual server (application feedback) (column 9: lines 45-52).

As in claim 16, Gamache discloses the system of claim 12, wherein the load-balancing instructions are further operable to determine a load on each physical server (column 9: lines 45-51). ("These node capable of hosting the groups" implies the physical load on the server was determined in order to distinguish between those nodes capable of hosting groups and those nodes not capable of hosting groups.)

As in claim 17, Gamache discloses the system of claim 12, wherein the nodes include a master node (failover manager) and the load-balancing instructions are operable to be executed on the master node (column 7: 30-36).

As in claim 18, Gamache discloses the system of claim 12, wherein the load-balancing instructions are operable to migrate a first virtual server (group) and a second virtual server (group) from a first node, the first virtual server being migrated to a second node of the system and the second virtual server being migrated to a different, third node of the system (column 6:

lines 46-50). (Active groups being failed over the one or more nodes, implies one group goes to a first node and a different group goes to a second node.)

As in claim 19, Gamache discloses the system of claim 12, wherein the load-balancing instructions are operable to balance system load as part of a failover process (column 9: lines 45-52).

As in claim 20 Gamache discloses the system of claim 12, wherein the load-balancing instructions are operable to balance system load independent of any failover occurring (column 1: lines 21-23).

As in claim 25, Gamache discloses computer program product, tangibly stored on a computer-readable medium or propagated signal, for execution in multiple nodes of a file server system cluster, comprising instructions operable to cause a programmable processor to:

Detect a failure of a first node of the cluster; and

Migrate (failed over) each of multiple virtual servers (group) on the first node to a different node in the cluster (column 6: lines 39-48).

As in claim 26, Gamache discloses the product of claim 25, further comprising instructions to: migrate virtual servers in order of their respective priorities (column 9: lines 24-27). (Failing over according to an ordered list of owners is migrating in order of each group's respective priorities.)

As in claim 27 Gamache discloses the product of claim 25, further comprising instructions to:

Recognize a virtual server that is identified as not to be migrated in the event of node failure and prevent migration of a so-identified virtual server when it is on a node that fails (column 6: lines 46-50 and column 7: lines 25-37). (The manager initiates the migration. Only the active groups are migrated. This means that the manager recognized the inactive groups and prevents these inactive groups from being migrated.)

As in claim 31, Gamache discloses the product of claim 25, further comprising load-balancing instructions to:

Determine a load produced by each virtual server;

Calculate a balanced distribution of the virtual server loads across the nodes of the server, excluding any failed nodes; and

Perform load balancing by migrating one or more virtual servers from heavily loaded nodes to less heavily loaded nodes (column 9: lines 44-52).

As in claim 32, Gamache discloses the system of claim 31, wherein the nodes include a master node (failover manager) and the load-balancing instructions are operable to be executed on the master node (column 7: 30-36).

As in claim 33, Gamache discloses the system of claim 31, wherein the load-balancing instructions are operable to migrate a first virtual server (group) and a second virtual server (group) from a first node, the first virtual server being migrated to a second node of the system and the second virtual server being migrated to a different, third node of the system (column 6: lines 46-50). (Active groups being failed over the one or more nodes, implies one group goes to a first node and a different group goes to a second node.)

4. Claims 22, 23 and 35 are rejected under 35 U.S.C. 102(e) as being anticipated by Hebert (6,732,186).

As in claim 22, Hebert discloses a file server system, comprising: a node configured with a virtual server having two or more simultaneously active virtual IP addresses (column 13: lines 13-27). (Multiple servers on a single machine is a virtual server.)

As in claim 23, Hebert discloses the system of claim 22, wherein the node is configured with a second virtual server having two or more other simultaneously active virtual IP addresses (Figure 13: components 1302A and 1302B).

As in claim 35, Hebert discloses a computer program product, tangibly stored on a computer-readable medium or propagated signal, for execution in a node of a file server system cluster in which virtual servers have virtual IP addresses associated with physical ports (figure

13: components 1302A and 1302B), the product comprising instructions operable to cause a programmable processor to:

Detect a failure of a physical port on a first node, the node having two or more physical ports, the node having one or more virtual servers each have one or more virtual IP addresses associated with physical ports (column 13: lines 13-27, column 14: lines 8-13 and figure 13: components 1302A and 1302B); (Multiple servers on a single machine is a virtual server.)

Identify one or more other physical ports on the file server node as being good; and migrate each virtual IP addresses associated with the failed physical port to a good physical port on the file server node (column 14: lines 13-23).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gamache as applied to claim 1 above.

Regarding claim 4, Gamache discloses the system comprising a virtual interface to a file system, above. However, Gamache does not specifically disclose the type of file system.

It would have been obvious to a person skilled in the art at the time the invention was made to have clients access the file system using NFS or CIFS protocols. It would have been obvious because both are well know file-sharing protocols.

7. Claims 3, 10 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gamache as applied to claims 1 and 25 above, and further in view of Hebert (6,732,186).

Regarding claim 3, Gamache discloses the system comprising a virtual interface comprising a virtual IP address above. However, Gamache does not specifically disclose the virtual interface comprising two of more virtual IP addresses.

Hebert discloses a virtual server comprising two or more virtual IP addresses (column 13: lines 13-27). (Multiple servers on a single machine is a virtual server.)

It would have been obvious to a person skilled in the art at the time the invention was made to have multiple virtual IP addresses per virtual server on the system taught by Gamache. It would have been obvious because Hebert teaches the multiple virtual IP addresses provides for physical server redundancy and load balancing (column 13: lines 19-21). A person skilled in the art would have understood that more virtual IP addresses per virtual server would improve the reliability of Gamache's system.

Regarding claim 10, Gamache discloses virtual servers having exclusive resources with a virtual IP address above. Wherein, when a failure occurs on one node, all virtual IP addresses

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along with all virtual servers attached to the virtual IP address migrated to a second node (column 6: line 2-5 and lines 39-50). However, Gamache does not specifically disclose the node having multiple physical ports.

Hebert discloses a node with a virtual server with multiple ports. Wherein, when a failure or degradation is detected on a physical port on a first node a determination is made whether any other physical port on the first node is good and virtual IP addresses associated with the failed physical port are migrated to a good physical port on the first node if there is such a good port (column 13: line 14-26).

It would have to a person skilled in the art at the time the invention was made to include the method taught by Hebert in the system taught by Gamache. It would have been obvious because Hebert teaches that having more than one port on a node prevents having single points of failure (column 1: lines 46-53, column 3: lines 62-65 and column 4: lines 34-38) and Gamache teaches that when a node fails its processes can be migrated to another working node (column 6: lines 39-50) to avoid a disruption of service. A person skilled in the art would have understood that adding the feature of Hebert's system to Gamache's system would increase the robustness and reliability of the server system.

Regarding claim 29, Gamache discloses virtual servers having exclusive resources with a virtual IP address above. Wherein, when a failure occurs on one node, all virtual IP addresses along with all virtual servers attached to the virtual IP address migrated to a second node (column 6: line 2-5 and lines 39-50). However, Gamache does not specifically disclose the node having multiple physical ports.

Hebert discloses a node with a virtual server with multiple ports. Wherein, when a failure or degradation is detected on a physical port on a first node a determination is made whether any other physical port on the first node is good and virtual IP addresses associated with the failed physical port are migrated to a good physical port on the first node if there is such a good port (column 13: line 14-26).

It would have to a person skilled in the art at the time the invention was made to include the method taught by Hebert in the system taught by Gamache. It would have been obvious because Hebert teaches that having more than one port on a node prevents having single points of failure (column 1: lines 46-53, column 3: lines 62-65 and column 4: lines 34-38) and Gamache teaches that when a node fails its processes can be migrated to another working node (column 6: lines 39-50) to avoid a disruption of service. A person skilled in the art would have understood that adding the feature of Hebert's system to Gamache's system would increase the robustness and reliability of the server system.

8. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gamache (6,453,426) in view of Hebert. (6,732,186).

Regarding claim 38, Gamache discloses a file server node, comprising:

The node being configured to run two or more virtual servers, each virtual server having as exclusive resources a virtual interface to clients and one or more file systems, each virtual interface comprising a virtual IP address (column 4: lines 45-48, column 5: line 62- column 6:

line 5 and lines 39-50 and figure 4). (The nodes that make up the cluster are comprised of groups. Each group includes all of the elements needed to run a specific application including an IP address. The IP address is the virtual interface to clients (column 6: line 2-5). The computing environment for which this system is intended includes an interface to file system (column 4: lines 45-48). Each group contains an application that depends in an IP address. When a node fails, its active groups are pulled to a different node. The group is including its IP address, meaning that it is a virtual IP address.)

However, Gamache does not specifically disclose the server node having two of more physical ports. Hebert discloses a node running a virtual server with two ports Wherein, when a failure or degradation is detected on a physical port on a first node a determination is made whether any other physical port on the first node is good and virtual IP addresses associated with the failed physical port are migrated to a good physical port on the first node if there is such a good port (figure 13: components 1302A, NIC 1310A and 1310B and column 13: line 14-26).

It would have to a person skilled in the art at the time the invention was made to have the multi-port mechanism taught by Hebert on the nodes of Gamache's system. It would have been obvious because Hebert teaches that having more than one port on a node prevents having single points of failure (column 1: lines 46-53, column 3: lines 62-65 and column 4: lines 34-38). A person skilled in the art would have understood that adding the feature of Hebert's system to Gamache's system would increase the robustness and reliability of the server system.

9. Claims 24 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hebert (6,732,186) in view of Gamache (6,453,426).

Regarding claim 24, Hebert discloses a file server system, comprising:

Two or more nodes, each node being configured to run a virtual server having a virtual IP address, and each node being configured with two or more physical ports (figure 13: components 1302A and 1302B); wherein a first node is further configured to:

Detect a failure of a physical port on the first node (column 14: lines 8-13);

Determine whether any other physical port on the first node is good; (It is interpreted that this step take place in the failover.)

Migrate all virtual IP addresses associated with the failed physical port to a good physical port on the first node if there is such a good port (column 14: lines 13-23).

However, Hebert does not specifically disclose migrate all virtual IP addresses associated with the failed physical port along with all virtual servers attached to such virtual IP addresses to a different, second node if there is no such good port on the first node.

Gamache discloses a two of more nodes with virtual servers having virtual IP addresses, wherein when a first node fails all the virtual IP addresses along with all virtual services attached to the IP address are migrated to a second node (column 6: lines 2-5 and lines 39-50) (Each group contains an application that depends in an IP address. When a node fails, its active groups are pulled to a different node. The group is including its IP address, meaning that it is a virtual IP address.)

It would have to a person skilled in the art at the time the invention was made to include the method taught by Gamache in the system taught by Hebert. It would have been obvious because Hebert teaches that having more than one port on a node prevents having single points of failure (column 1: lines 46-53, column 3: lines 62-65 and column 4: lines 34-38) and Gamache teaches that when a node fails its processes can be migrated to another working node (column 6: lines 39-50) to avoid a disruption of service. A person skilled in the art would have understood that adding the feature of Gamache's system to Hebert's system would increase the robustness and reliability of the server system.

Regarding claim 34, Hebert discloses a computer program product tangibly stored on a computer-readable medium or propagated signal, for execution in a node of a file server system cluster in which virtual servers have virtual IP addresses associated with physical ports (figure 13: components 1302A and 1302B), the product comprising instructions operable to cause a programmable processor to:

Detect a failure of a physical port on the first node (column 14: lines 8-13);

Determine whether any other physical port on the first node is good; (It is interpreted that this step take place in the failover.)

Migrate all virtual IP addresses associated with the failed physical port to a good physical port on the first node if there is such a good port (column 14: lines 13-23).

However, Hebert does not specifically disclose migrate all virtual IP addresses associated with the failed physical port along with all virtual servers attached to such virtual IP addresses to a different, second node if there is no such good port on the first node.

Gamache discloses a two of more nodes with virtual servers having virtual IP addresses, wherein when a first node fails all the virtual IP addresses along with all virtual services attached to the IP address are migrated to a second node (column 6: lines 2-5 and lines 39-50) (Each group contains an application that depends in an IP address. When a node fails, its active groups are pulled to a different node. The group is including its IP address, meaning that it is a virtual IP address.)

It would have to a person skilled in the art at the time the invention was made to include the method taught by Gamache in the system taught by Hebert. It would have been obvious because Hebert teaches that having more than one port on a node prevents having single points of failure (column 1: lines 46-53, column 3: lines 62-65 and column 4: lines 34-38) and Gamache teaches that when a node fails its processes can be migrated to another working node (column 6: lines 39-50) to avoid a disruption of service. A person skilled in the art would have understood that adding the feature of Gamache's system to Hebert's system would increase the robustness and reliability of the server system.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

See PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anne L Damiano whose telephone number is (703) 305-8010. The examiner can normally be reached on M-F 9-6:30 first Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Beausoliel can be reached on (703) 305-9713. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ALD



SCOTT BADERMAN
PRIMARY EXAMINER